Journal of
HYPERTENSION RESEARCH
www.hypertens.org/jhr

Original Article

J Hypertens Res (2016) 2(1):36–44

Current tendency in cardiovascular risk of Romanian adult population

Oana-Florentina Tautu [a,b] *, Roxana Darabont [a,c], Maria Dorobantu [a,b]

[a] Carol Davila University of Medicine and Pharmacy,
[b] Clinical Emergency Hospital Bucharest, Cardiology Department,
[c] University Emergency Hospital Bucharest, Cardiology Department, Bucharest, Romania

Received: February 14, 2016, Accepted: March 13, 2016

Abstract

The aim of this study was to evaluate the prevalence of cardiovascular (CV) risk factors and the cardiovascular risk of the Romanian adult population and their tendency in the last 7 years. SEPHAR II, the second cross-sectional national representative survey with 1975 adult subjects (69% response rate) investigated by means of a questionnaire (demographics, life style, medical history,), blood pressure, anthropometric measurements and laboratory work-up. Targets of the analysis were traditional CV risk factors used evaluate 10-year risk of fatal CV events by SCORE chart for high risk countries: age, sex, smoking, systolic blood pressure (SBP) and total serum cholesterol and diabetes mellitus (DM). The study sample had a mean age of 47.14±15.41 years with a female predominance (52.6%). Smoking prevalence was 26.9%, with a 7% decrease than 7 years ago. Mean SBP was 132.47±22.36mmHg, on average with 4mmHg lower than the value from 7 years ago. Mean total serum cholesterol was 205.16±46.22mg/dl, on an average with 9mg/dl higher than the value from 7 years before. DM prevalence (9%) has almost doubled in the last 7 years. The median 10-year risk of fatal CV events was 1%, the majority belonging in the low-moderate risk category (SCORE <5%). In the last 7 years, there's been no significant change in the proportion of adults at very high 10-year risk of fatal CV events. Although the trend of some of the cardiovascular risk factors in the past seven years seems to be a descending one, Romania currently still remains a high CV risk country.

Keywords: cardiovascular risk, risk factors, survey

Introduction

Cardiovascular disease (CVD), leading cause of death worldwide [1], is responsible for more than 62% of all deaths in Romania [2]. The annual CV death rate estimated in 2005 at 17.5 million is expected to increase to approximately 20 million by 2015 [1].

Facing daily these alarming numbers, health workers need a more detailed evaluation of the problem in order to develop optimal strategies to control the disease.

So far, the only way to control "the CVD epidemic" is its prevention by identifying those individuals at increased risk of developing CVD on the one hand and on the other

* Correspondence to: Dr. Oana-Florentina TAUTU, MD, PhD Clinical Emergency Hospital Bucharest, 8 Calea Floreasca, Bucharest 014461, Romania. Tel.: +40 742 146987, fax: +40 21 3170108, e-mail: dr.tautu@yahoo.com

©The Author(s) 2016. This article is published with open access under the terms of the Creative Commons Attribution License.

hand by implementing at a population level a coordinated set of actions targeting the modifiable CV risk factors connected to life-style, such as smoking, unhealthy diet and physical inactivity [3].

But so far, in Romania CVD prevention still represents a major challenge for all the healthcare policy planners. This is mainly due to the lack of available data regarding the prevalence of CV risk factors and their past and future trends in the adult Romanian population that could allow the policy planners to build up population-based prevention strategies for CVD in our Country.

But in the last 10 years some important steps have been made in order to gather this crucial "edifice" on which to base a future national project for CVD prevention.

The first representative data for Romania's entire population regarding cardiovascular risk factors' prevalence and total cardiovascular risk comes from SEPHAR I (abbreviation for the full title: Study for the Evaluation of Prevalence of Hypertension and Cardiovascular Risk in Romania), the first epidemiological study based on a representative sampling for the entire adult population of Romania, carried out in 2005 [4]. Its results confirmed Romania as a high cardiovascular risk country [5].

The current evaluation of cardiovascular risk factors' prevalence and total cardiovascular risk comes from the second epidemiological study, SEPHAR II carried out in 2012, aiming for a more accurate estimation of prevalence of CV risk factors and total CV risk among Romania's adult population and their tendency during 2005 – 2012. Alongside arterial hypertension, other CV risk factors studied in SEPHAR II include obesity, diabetes mellitus (DM), lipid disorders, uric acid, smoking, sedentary lifestyle and family history of premature CVD.

The aim of this study is to analyze the prevalence of the traditional CV risk factors used to estimate the 10-year risk of fatal CV events by SCORE chart: age, smoking, diabetes, systolic blood pressure (SBP) and total serum cholesterol and to evaluate their past 7-year tendency in the adult Romanian population and to evaluate the current CV risk of the Romanian adult population by SCORE and its tendency in the last 7 years.

Material and methods

The two SEPHAR surveys were conducted at approximately 7-year interval (SEPHAR I between February – November 2005 and SEPHAR II between October 2011 – March 2012) on representative samples for the entire Romanian adult population (SEPHAR I – 2017 subjects and SEPHAR II -1975 subjects). The methodology of both surveys is already published [4–7] and will not be discussed further on. In summary, during the two study visits, each enrolled subject, who give a written consent for participation, was evaluated by a study questionnaire (regarding demographics, life-style and medical history) anthropometric measurements, three blood pressure (BP) measurements (AAMI certificated oscillometric BP measuring devices, following current ESH-ESC guidelines [8] and laboratory work-up consisting of fasting plasma glucose (FPG), glycated hemoglobin (HbA1c), lipids (total plasma cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides) serum creatinine, serum ionogram and spot albuminuria by urinary albumin to creatinine ratio.

Diabetes mellitus (DM) was defined by 3 different criteria as follows: a fasting plasma glucose (FPG) ≥ 126mg/dl, a self-reported history of diabetes with concurrent use of antidiabetes medication, regardless of FPG values or a HbA1c ≥ 6,5%. FPG between 100-125mg/dl was interpreted as impaired fasting glucose (IFG). A FPG below 100mg/dl was considerate as a normal blood glucose level.

Cardiovascular risk was assessed using SCORE chart for high risk countries [9]. CV risk categories were defined as follows: low - medium risk - SCORE <5%; high risk - SCORE 5-9%; very high risk - SCORE ≥ 10% or the presence of at least one of the following, regardless of SCORE values: manifest CV disease (ischemic heart disease, peripheral artery disease, stroke), diabetes mellitus, moderate-severe renal failure (eGRFMDRD < 60ml/min/1.73m^2)

Statistical analysis

A descriptive analysis (means, medians, standard deviations, and range for continuous data and frequency analysis for categorical data) was performed for all the target variables. Kolmogorov-Smirnov test was used to analyze continuous data distribution, according to which independent samples t test or Mann-Whitney U test were further used in analysis for differences between means of 2 independent study subgroups and ANOVA or Kruskal-Wallis test were further used in analysis for differences between means of ≥3 independent study subgroups . Chi-square test was used to analyze differences between categorical data.

Statistical analysis was performed with IBM SPSS Statistics 20.0 software at a significance level of $p < 0.05$.

©The Author(s) 2016

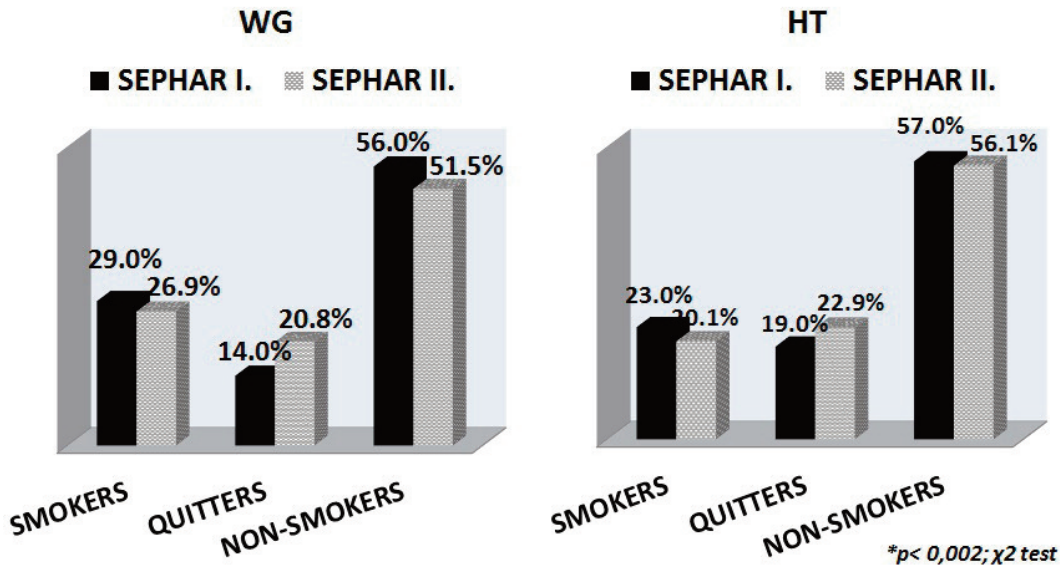

Figure 1. Smoking prevalence in the last 7 years. WG: whole group; HT: hypertensive group.

Results

Age and gender distribution of the study sample

The study sample had a female predominance [females: 52.6% vs. males: 47.4%; p = 0.023]and a mean age of 47.14±15.41 years (range 18-80 years) with the following age group distribution: 18-24 years: 2.3%; 25-34 years: 25.2%; 35-44 years 19.1%; 45-54 years 26.9%, 55-64 years 7.4% and ≥65 years 19.2%.

Smoking

Total smoking prevalence was 26.9% (532 subjects), significantly higher in normotensives than in hypertensive ones (HT: 20.2% vs. normal BP: 31.8%; p < 0.0001).

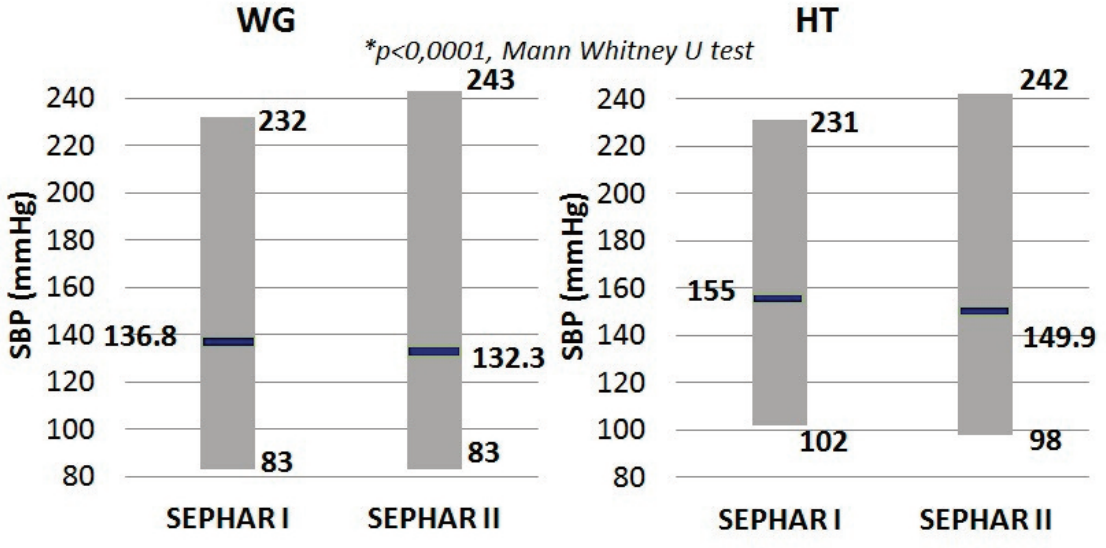

Figure 2. Systolic blood pressure values' tendency in the last 7 years. WG: whole group; HT: hypertensive group; SBP: systolic blood pressure.

©The Author(s) 2016

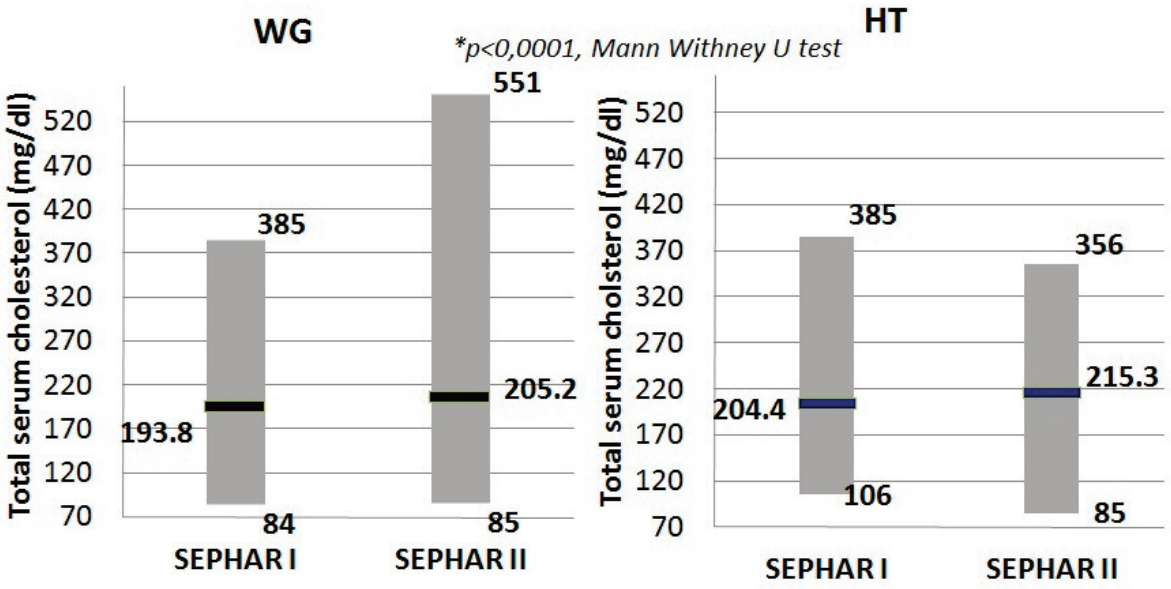

Figure 3. Total serum cholesterol levels' tendency in the last 7 years. WG: whole group; HT: hypertensive group.

The proportion of smokers recorded in male subjects was significantly higher than those recorded in female subjects (females: 19.6% vs. males: 35.6%; $p < 0.0001$)

With increasing age, there is a significant decrease in the proportion of smokers (18-24 years: 33.3% vs. 25-34 years: 33.9% vs. 35-44 years: 31.4% vs. 45-54 years: 32.3% vs. 55-64 years : 24% vs. ≥ 65 years: 6.7%; $p < 0.0001$)

Smoking prevalence is similar in rural and urban areas (rural: 25.7% vs. urban: 28.1%; $p = 0.071$).

Comparing with the results from SEPHAR I, there has been a decrease of the number of smokers both in the whole group and in hypertensives' group (Figure 1).

Systolic blood pressure

Mean SBP was 132.47±21.35mmHg, increasing with age from 117.95±15.93 mmHg in the youngest group up to 149.81±22.36 mmHg in the oldest group. Although the mean SBP value of the males subjects was significantly higher than the one of the female subjects (SBP: 133.81±18.56 vs. 131.27±23; $p < 0.0001$; $p = 0.054$), dividing by age groups this difference was noticed only until late fifties when both mean SBP was similar in both sexes until late sixties, when females' SBP was significantly higher than males.

Between 2005 and 2012 there has been a significant reduction in mean SBP, reduction that is present in the whole adult population (~4mmHg difference) as well as in HT adult population (~5mmHg difference) (Figure 2).

Total serum cholesterol

Mean total serum cholesterol value was 205.16±46.22mg/dl (range 85.3mg/dl - 551.10mg/dl) increasing with age, from the lowest value of 160.10±24.87mg/dl in the youngest group up to the highest value of 223.24±46.82mg/dl recorded in the 55-64 years' group, with no significant difference between genders [males: 205.63±45.24 vs. females: 204.74±47.11mg/dl; $p = 0.312$] or between the urban and rural area of residence [rural: 207.27±46.68mg/dl vs. urban: 203.79±45.89mg/dl; $p = 0.136$].

Mean total cholesterol level was significantly higher (on an average with 17mg/dl) in hypertensive subjects than the one recorded in the normotensives ones [215.29±46.83mg/dl vs.198.29±44.55mg/dl; $p<0.0001$].

In the last 7 years there has been a significant increase in mean total serum cholesterol levels, in the whole adult population (~9 mg/dl difference) as well as in HT adult population (~11mg/dl difference) (Figure 3).

Diabetes mellitus

The prevalence of DM was 9.5% (188 subjects) for the whole sample, with 3.7% (43 subjects) in normotensives and 18.2% (145 subjects) in hypertensive subjects.

From the total number of 188 diabetic subjects, the majority (7.34%) are known diabetics, only 2.18% being newly diagnosed on the inclusion in our study.

©The Author(s) 2016

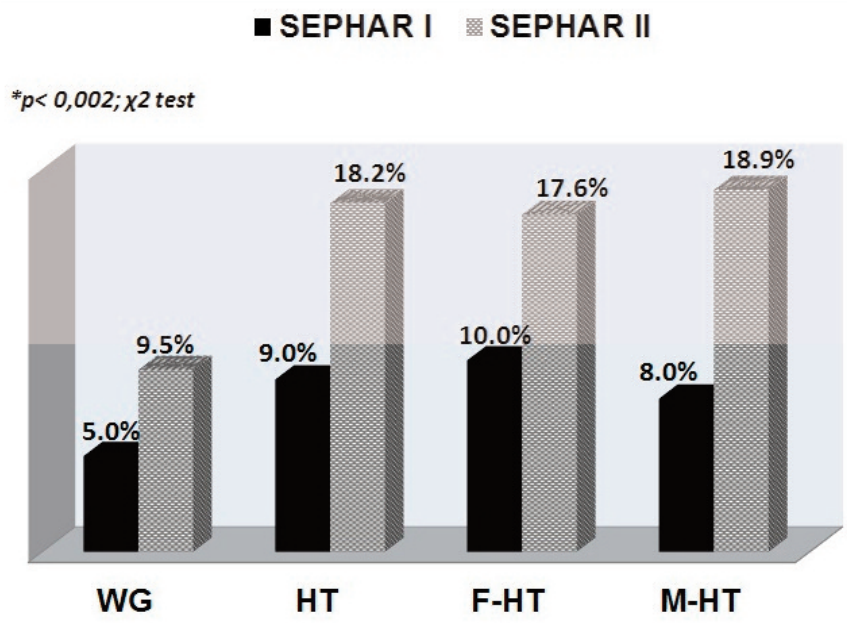

Figure 4. Diabetes mellitus prevalence in the last 7 years. WG: whole group; HT: hypertensive group; F-HT: female hypertensives; M-HT: male hypertensives.

In urban areas, total prevalence of DM and the prevalence of known DM are significantly higher than in rural areas, while the prevalence of newly diagnosed DM is similar in both areas of residence.

The highest DM prevalence (25.3%, 37 subjects), either known (20.5%, 30 subjects) or newly diagnosed (4.8%, 7 subjects), was recorded in the 55-64 years group.

While total DM prevalence and known DM prevalence is similar in males and females, the prevalence of newly diagnosed DM is significantly higher in males than in females.

The total DM prevalence and the prevalence of known and newly diagnosed DM are significantly higher in hypertensive subjects than in normotensives (total DM: 18.2%, 145 subjects vs. 3.7% 43 subjects, $p < 0.0001$; known DM: 14.7%, 117 subjects vs. 2.4% 28 subjects, $p < 0.0001$; newly diagnosed DM: 3.5%, 28 subjects vs. 1.3% 15 subjects, $p < 0.0001$).

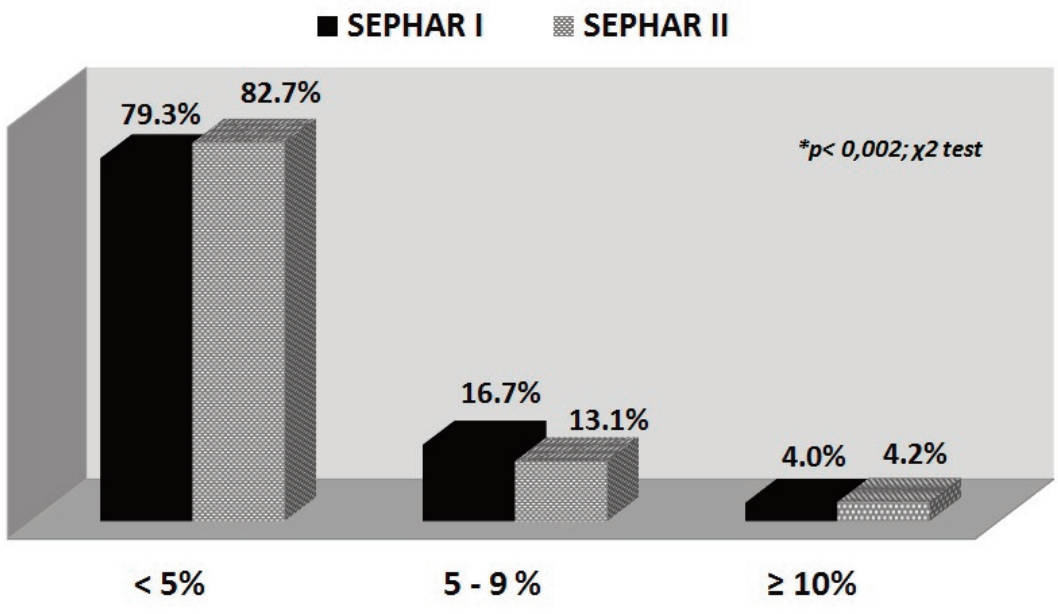

Figure 5. 10-year risk of fatal CV events by SCORE.

©The Author(s) 2016

It is worth pointing out the prevalence of IFG which reached 16.3% (322 subjects) in the global sample, 11,8% (139 subjects) among normotensives and 23% (183 subjects) among hypertensives, knowing that this category represents the future diabetic subjects especially knowing that we had only one measurement of FPG and of HbA1c, a second set of this measurements would classify these subjects as diabetics.

In the last seven years, the prevalence of diabetes showed a statistically significant increase both in the entire group as well as among hypertensives' group (Figure 2).

An increased prevalence of diabetes was recorded both in females and in males in the hypertensives group (Figure 4).

10-year risk of fatal CV events by SCORE

According to SCORE chart for high CV risk countries, median value of 10-year risk of fatal CV events of the study group was 1%, ranging from 0% - 44%. Male subjects had a significantly higher risk compared with female subjects and this difference remained significant after adjustment for area of residence (rural area: F- 1.70% vs. M – 2.52%; $p < 0.0001$; urban area: F- 1.52% vs, M – 3.22%; $p < 0.0001$).

Comparing with the situation from 7 years ago, SEPHAR II showed a significant increase in the proportion of subjects with low and moderate 10-year risk of fatal CV events (SCORE < 5) in parallel with a significant decrease in the proportion of subjects with high 10-year risk of fatal CV events (SCORE 5-9), but a similar proportion of subjects with very high 10-year risk of fatal CV events (SCORE ≥10) (Figure 5).

Discussion

The second epidemiologic national representative survey SEPHAR II brings both good and bad news regarding traditional CV risk factors' tendency in the last seven years.

With a smoking prevalence of 26.9%, we can estimate that in 2014 in Romania are 4.5 million adult smokers of which 1.4 million are hypertensive.

The good news is that in the last seven years, there has been a 7% decrease in smoking prevalence among the adult population of Romania and a 12.6% decrease in smoking among the hypertensive population. This may be the result of mass-media anti-smoking campaigns, the increase in the price of tobacco cigarettes and medical recommendations (for hypertensive subjects) that have been implemented in the last 7 years. This positive trend may be sustained by the recent adopted legislative measures in order to ban smoking in public places in order to reach the goal of eradicating this major CV risk factor. This positive tread has been also evidenced by other epidemiological studies performed in the last 5 years in Central and East-European countries. [10-13]

Another positive aspect is the 4mmHg decrease in systolic blood pressure value in the whole adult population and the 5mmHg decrease in SBP in hypertensive population. This may be the result of the improvement in the detection rate of HT in the last 7 years together with a significant increase in the awareness of blood pressure and antihypertensive treatment and control, highlighted by previous published papers from SEPHAR II results [6,14-17]

By far, the most alarming results are related to the prevalence of diabetes mellitus with almost double the prevalence of these disease in the general adult population, and almost triple among hypertensive adults. Based on the data from SEPHAR II we can estimate that DM affects 1.6 million Romanian adults from which 1.2 million are previously diagnosed, almost 370 thousands representing newly diagnosed DM cases. Another aspect worth pointing out is the existence of approximate 3 million Romanian adults which are future candidates for the diabetic title (IFG cases), requiring special intervention programs in order to prevent them from becoming diabetics.

In this light, the SEPHAR II results on total cholesterol levels showing a 9 mg/dl increase in the average total cholesterol level of the whole adult population and an 11 mg/dl increase in the average total cholesterol level in the hypertensive adult population, is not surprising. This may be also linked to the high prevalence of obesity revealed by SEPHAR II [15, 16].

Knowing this current tendency of the traditional CV risk factors it is now clear why in the last 7 years the proportion of adult Romanian population at very high 10-year risk of fatal CV events has not changed.

Conclusions

The decrease in smoking prevalence among Romanian adult population is encouraging but eradication of this major risk factor remains a target still not achieved.

The improvement in average systolic blood pressure value in the adult Romanian population is encouraging,

©The Author(s) 2016

but efforts to prevent and control hypertension should continue.

Special attention should be focused on the increasing "diabetic epidemic" that our adult population is facing.

Although the trend of some of the cardiovascular risk factors' in the past seven years seems to be a descending one, Romania at this time remains a high CV risk country.

Perspectives

Given these SEPHAR II results, the Romanian Society of Hypertension (SRH) started since 2012 a series of actions ultimately aimed at improving the quality of care to patients with hypertension and increase awareness of both the general public and the authorities on the HTA and major cardiovascular risk factors.

Furthermore, in November 2015, SRH initiated a new epidemiological study - SEPHAR III which will take place in the whole country until April, on a representative sample for the adult population of Romania (2.000 adult subjects). This is the necessary step towards knowing the current situation in the prevalence of hypertension and other CV risk factors and in order to appreciate both their evolving tendency in recent years and the effect of these series of actions conducted by RSH.

Acknowledgements

SEPHAR II survey was conducted with financial founding from Romanian Society of Hypertension and SERVIER PHARMA – Romanian Branch.

The authors express their gratitude to all the general practitioners, nurses and residents that have been involved in this study (Appendix 1).

Conflict of interest

The authors confirm that there are no conflicts of interest

List of abbreviations used

BP: blood pressure, CV: cardiovascular, CVD: cardiovascular disease, DM: diabetes mellitus, eGRFMDRD: estimated glomerular filtration rate calculated by modified diet in renal disease formula, FPG: fasting plasma glucose, HbA1c: glycated hemoglobin, IFG: impaired fasting glucose, SBP: systolic blood pressure, SEPHAR: Study for the Evaluation of Prevalence of Hypertension and Cardiovascular Risk in Romania

References

1. World Health Organization. Cardiovascular Diseases: Fact Sheet No. 317. Geneva, Switzerland: WHO, 2007. Available from: http://www.who.int/mediacentre/factsheets/fs317/en/index.html.
2. European Cardiovascular Disease Statistics 2012. Available from: http://www.ehnheart.org/cvd-statistics.html.
3. Pajak A, Kozela M. Cardiovascular Disease in Central and East Europe. Public Health Reviews. 2012; 33:416-35.4. Dorobantu M, Darabont R.O., Badila E. and Ghiorghe S. Prevalence, Awareness, Treatment, and Control of Hypertension in Romania: Results of the SEPHAR Study. Int J Hypertens. 2010 Feb 1; 2010:970694.
5. Dorobantu M., Badila E., Ghiorghe S., Darabont R.O., Olteanu M. and Flondor P. Total Cardiovascular Risk Estimation in Romania. Data from SEPHAR Study. Rom J Intern Med. 2008;46(1):29-37.
6. Dorobanțu M., Darabont R., Ghiorghe S., Arsenescu-Georgescu C., Macarie C., Mitu F. et al. Hypertension prevalence and control in Romania at a seven-year interval. Comparison of SEPHAR I and II surveys. J. Hypertens. 2014; 32(1):39-47
7. Dorobantu M., Tautu OF, Darabont R, Ghiorghe S., Badila E., Minca D. et al. Objectives and Methodology of Romanian SEPHAR II Survey. Project for Comparing the Prevalence and Control of cardiovascular risk factors in two East-European Countries: Romania and Poland. Archives of Medical Science. Arch Med Sci. 2015 Aug 12; 11(4): 715–723
8. Mancia G, Fagard R, Narkiewicz K., Redon J., Zanchetti A., Bohm M. et al. 2013 ESH-ESC Guidelines for the management of arterial hypertension, Jornal of Hypertension. 2013; 31: 1281–1357
9. Conroy RM, Pyörälä K, Fitzgerald AP, Sans S, Menotti A, De Backer G, et al; SCORE project group. Estimation of ten-year risk of fatal cardiovascular disease in Europe: the SCORE project. Eur Heart J 2003; 24:987-1003.
10. Arici M, Turgan C, Altum B, Sindel S, Erbay B, Derici U et all. Hypertension incidence in Turkey (HinT): a population based study. Journal of Hypertension 2010; 28:240-244.
11. Lovic D, Stojanov V, Jakovljevi B et all. Prevalence of arterial hypertension in Serbia: PAHIS study. J Hypertens. 2013 ;31(11):2151-215712.
12. Gallus S1, Lugo A, La Vecchia C, Boffetta P, Chaloupka FJ, Colombo P. et al. Pricing Policies And Control of Tobacco in Europe (PPACTE) project: cross-national comparison of smoking prevalence in 18 European countries. Eur J Cancer

©The Author(s) 2016

Prev. 2014 May;23(3):177-85. doi: 10.1097/ CEJ. 0000000000000009.
13. Kotseva K, Wood D, De Bacquer D, De Backer G, Rydén L, Jennings C et al. EUROASPIRE IV: A European Society of Cardiology survey on the lifestyle, risk factor and therapeutic management of coronary patients from 24 European countries. Eur J Prev Cardiol. 2015 Feb 16. pii: 2047487315569401.
14. Dorobantu M. Why do we need a new national survey? SEPHAR III - The next step. J Hypertens Res (2015) 1: 9-15.
15. Dorobantu M., Bartos D., Apetrei E., Arsenescu-Georgescu C., Pop D., Ghiorghe S. et.al. Hypertension in Romania: where are we and what we do? Results from SEPHAR II study. Romanian Journal of Cardiology, 2012; 22 (4): 285-292
16. Doroban□u M., Darabont R., Ghiorghe S. Dobreanu M., Babes K., Pop D. et al. Profile of the Romanian Hypertensive Patient. Data from SEPHAR II study. Romanian Journal of Internal Medicine, vol 50, no 4, 2012, pg 285-296
17. Doroban□u M, Onciul S., Darabont R. Tautu O., Ghiorghe S., Vasilescu M. et.al. Arterial Hypertension Epidemiology: Romania among the Balkan Countries – Data from SEPHAR Surveys. Medicina Modern□, 2014, (21) 1: 10-16

SEPHAR II's investigators and residents involved in the SEPHAR II survey are listed in Appendix I (see next page)

©The Author(s) 2016

Appendix 1

SEPHAR II's investigators

AFRIM Valentin, ANDREI Mirela, BALAUTA Lucia, BOSTAN Elisabeta, BRATOSIN Remus, BUNESCU Florin, CALIMAN Marinela, CANTARAGIU Daniela, CHELARESCU Costilena, CHIRLEJAN Carmen, CIOLOBOC Iulia, CIRIN Horia, CIUSLEANU Ruxandra, CLINIC Maria, COMAN Mihaela, CORDEA Delia COSMELEATA Ion, CUCOANES Cristina, CULDA Ligia, CULICIANU Doru, CURETEAN Raluca, DASCAL Pompilia, DOGARU Adriana, DONIGA Milena, DRAGNE Carmen, DULIPOVICI Milena, DUMITRESCU Dragos, DUMITRESCU Ileana, ENE Aqueline Karina, FARAGAU Adriana, FLORESCU Dan, FLORESCU Mirela, GAVRILESCU Dan, GHEBERTA Nicoleta, GHEORGHIU- TUDOR Titina, GRECU Cristinel, GRIGORIU Adina, GUZGA Cristina, HUDICI Virgiliu Daniel, IONESCU Viorica, IONICA Carmen Silvia, IORDACHE Cleopatra, ISAC Doina, LAKATOS Maria, LASCU Gheorghe, MARINESCU Anca, MICU Draga, MIHAILA Carmen, MOACA Adriana, MOSNEAGA Daniela Ligia, MOTORAN Daniela, MURESAN Sofia, NEAGOE Daniela, NEAGU Laura, NEDELCU Daniela, NISTOR Cristina, NISTOR Ileana, OLARU Diana, OLTEAN Violeta, OLVEDI Iosif, DEACONU Daniela Florina, ORBOCEA Daniel Victor, PALADE Emilian, PAPUC Ruminita, PARVAN Doru, PASZTOR Gyongyver, PEIA Andreia, PETRACHE Angelica, PETRESCU Amalia, PRISCOVEANU Angela, RADOIU Anina, RUSTI Anca Valentina, SARBU Elena, SARBU Teodora, SIPOS Elisabeta, SOSDEANU Marius, SPANOIU Mihai, TAMASOI Monica, TARABOANTE Anca-Paula, TATUCU Cristian, TITE Dorina, TOFAN Alexandru ,TOLNAI Angela, TOMA Ioana Daciana, TOMESCU Viorel Dan, TOPOLOGEANU Gabriela, TRIFESCU Daniela, TUDORACHE Elena, UDREA Dumitra, ULITA Andreea, UNGUREANU Mihai, UNGURIANU Daniela, UTA Leonard, VARLAN Constantin, VIISOREANU Melania, VLADIMIRESCU Suzana, VLAS Smaranda, VLEJU Victoria, VONICA Roxana Georgeana, ZARNOIANU Zizi, ZBARCEA Silvia, TRANCA Iulia.

Residents involed in the SEPHAR II survey

DRAGOESCU Bogdan, MARINESCU Mihai, VACARESCU Cristina, ONCIUL Sebastian, BATAILA Vlad, DEACONU Alexandru, COMANESCU Ioana, GEORGESCU Alina, ROTARU Iulia, UDREA Florian, MICOARA Adolf, BORGA Ciprian, SILEA Daniela, IANA Andreea, COSTEA Andreea Codrina, NAGY Elena, FLOREA Ramona, ANDREi Razvan, LUPU Dragos, CODRUT Ciurea, ZAH Anamaria, MADA Laura, MARGINEAN Teodora, LASLO Ioana, NATRAPAZU Alina, IOSIP Adriana, MARKOVITS Corina, SABIESCU Bogdan Mihai, ADRIAN Raducan, DAMIAN Iulia, VASILE Roxana, POPESCU Monica, BATAR Sergiu, BOLEA Florina, TEODORU Minodora, MIRICA Daniel.

©The Author(s) 2016